



Tasks vs. Who Legend	
Strong	● 9
Moderate	○ 3
Weak	△ 1
	◎ 2
	● 7

	2 fluid equations	Gianakon/Callen neo-classical bootstrap formulation	sptizer resistivity	chi_E * del_perp^2 v_phi	del_dot_kappa_dot grad T	sub grid particle flux	vacuum region	B_tilda at wall (b.c.)	seperatrix (moving)	resistive wall b.c.	flux coordiantes	particle pushing Pi (kinetic)	E, rho_v, rho source terms (externally defined)	circuit model/plasma coupling	external coils	radiation (brem)	implicit time solve
actual geometry					●					●					●		
flow effects	●		●													●	
non-ideal MHD effects																	
neo-classical		●		●													
resistivty			●														
flow damping				●													
Two fluid effects	●																
field errors						○	●			●							
discharge evolution/external coils				○	○	○			○	○	●			●	●	○	
Sources (n,v,T)												●		●			
open field lines with plasma								●		●			○	○			
resistive wall				○						●							
energetic particles										●		●					
transport (n,v,t)				●	●	●					○						
high Temperatures	○		●		○												
scrape off layer				●	●	●			●								
island evolution times scales				○	○	○						○	○		△	●	

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	modular	pre-processor	post-processor	parallel architecture	software standards	GUI	documentation	version management	code validation	Milestones	Nov 19996 Prototype	July 1997 ITER Final	July 1998 Ultimate
ability to interact with analysis codes		●	●								◎		
easy to use	△	●	●			●	●				◎		
physical effects selection	●					●	●				◎		
portable	●			●	●							●	
dimensional input/output		●									◎		
good documentation							●					●	
validated output							△	●	●		◎	●	
interface to linear stability codes			●								◎		
scalable				●								●	
reasonable results turn around time				●								●	
flexible (extensible)	●				●		●	●	○			●	
reproduce experimental diagnostics			●			△	△		●		◎	●	
parameterized input		●				○					◎		
optimization seeking			●									●	
interfacing to engineering codes		●	●			△					◎	●	
technical support						○	●					●	
thermal/electrical/mechanical stress on external components			●										●
support different numerical algorithms	●	○		●	○						◎		

		Tasks vs. Who		
		Strong	Moderate	Weak
time stepping algorithm		●	○	△
modular				
pre-processor		●		
post-processor				
spatial discretization algorithm		●		
model equations				
parallel architecture				
software standards				
model boundary conditions				
GUI				
documentation				
version management				
code validation				
module validation				
validation against known solutions				
experimental validation				
	user interface			
	read user input	●		
	control program flow		○	●
	display results	●		
	pre-processor			
	set up IC's	●		
	set up BC's	●		
	geometry definition	●		
	grid generation	●		
	write input file for NIMROD	●		
	read input from codes		○	
	consistency check			□
	NIMROD solver			
	read IC's and grid	○		
	advance solution ($t \rightarrow t+dt$) with BC's	●		●
	quick diagnostics and status	●		
	write solution and grid to file	●		
	post-processor			
	read output from solver	●		
	data analysis	●		
	visualization	○		
	write output files to other codes	●		
	report generation	●		

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	actual geometry	flow effects	non-ideal MHD effects	neo-classical	resistivity	flow damping	Two fluid effects	field errors	discharge evolution/external coils	Sources (n,v,T)	open field lines with plasma	resistive wall	energetic particles	transport (n,v,t)	high Temperatures	scrape off layer
non-ideal soft beta limits/real plasmas	●	○		●	●	●	●	●	○					○	●	
ELMS																
extent (how deep)	●		△	●	○	○		○	○		●			●		
geometry of ELM	●			●	●	●	●	●			●			●		●
locked modes	●	●	●	●	●	●	●	●	△	●	●	●		○		
sawtooth reconnection	●			●	●	●				●	●	●	●	●	●	●
RFP current profile control				●	●	●	●	●		●	●	●		●	●	
helicity injection (tokamak)	●			●	●		△		●							●

NIMROD Tasks Matrix

Tasks vs. Who Legend	
Task Leader	● 9
Contributor	○ 3
ex-oficio	△ 1
Prototype	◎ 2
Final	● 7

	Steve Plimpton	Dan Barnes	Alan Glasser	Dalton Schnack	Mike Phillips	Ming Chu	Tom Gianakon	Alice Koniges	Jim Crottinger	Rick Nebel	Carl Sovinec	Oliver Suater	Linkages
A. Develop Pre-Processor													
A1. User Interface					●	○							A4,A5,E4
A2. Import Interface					○	○							
A3. Pre-Processor export							○						A4,A5,B3
A4. Initialization Modue for IC/BC							○						A1,A3
A5. Develop Grid Generator			○	○									A1,A3
B. Develop Solver													
B1. Solver Flowchart		●								○	○		B5, E1
B2. Develop user interface screens		○		●						○			E3,E4
B3. Pre-Processor Import		●								○			A3, B5
B4. Post Processor Export		●	○							○			C1
B5. Solver time advancement		●	○							○	○		B1, B3, F2, F3
C. Develop Post Processor													
C1. Solver Import			●										B4
C2. Report Generator			●										C3,F2, F3
C3. Develop User interface/screens			○		●								C2,E4
C4. Pre-Processor Import			●										
D. Integration													
D1. Define Software architecture/overall flowchart						○					○		E2, E4
D2. Define Integration Plan (feature list)													F2, F3
E. Management													
E1. Define Equations				●		○				○			B1,
E2. specify software standards				●									D1,
E3. Define Solver Diagnostics				●						○			B2
E4. Develop concepts of operation				●	○	○					○		A1, B2, C3, D1, F3
E5. Develop NIMORD documentation				●						○	○		
F. Testing													
F1. Modules/Unit testing				●							○		
F2. Benchmark to known experiments				●	○	○							B5, C2, D2
F3. compare to know solutions			○	●	○	○					○		B5, C2, D2, E4
F4. collect known experiments				●		○							
F5. Collect known solutions				●	○	○					○		